



PATENT
0649-0619P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: Yasuyuki TANAKA et al.
Application No.: 08/941,132 Group: 1713
Filed: September 30, 1997 Examiner: F. Zitomer
For: MODIFIED NATURAL RUBBER

DECLARATION UNDER 37 C.F.R. § 1.132

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, YOSHIAKI MIYAMOTO, declare the following.

I graduated from Kyoto University on March 24, 1984.

I was employed by Sumitomo Rubber Industries, Ltd., on April 1,
1984.

Since that time I have been engaged in research and development
concerning new materials.

I have read and understand the invention as described in the
present specification and claims and have read and understand the
Office Action dated December 7, 1999, and the references cited therein,
i.e., Yasuyuki et al. EP 0 584 597, Kondo et al. U.S. Patent No.
4,208,490, Burlett et al., U.S. Patent No. 5,118,546, and Hayashi et al.
U.S. Patent No. 4,528,340.

The present invention relates to either the grafting at a high efficiency or the epoxidizing at a high epoxidation ratio of rubber which has been modified by extracting the naturally occurring proteins.

In my opinion, the skilled artisan would not be motivated to modify the deproteinized polymer of Yasuyuki et al. by graft copolymerization as taught by Kondo et al. or by epoxidation as taught by either Burlett et al. or Hayashi et al.

Assuming for the sake of argument that the skilled artisan would be motivated to modify the deproteinized polymer of Yasuyuki et al. by graft copolymerization as taught by Kondo et al. or by epoxidation as taught by either Burlett et al. or Hayashi et al, the skilled artisan would not reasonably conclude that the resulting efficiency of the grafting and epoxidation processes would differ when using natural rubber versus deproteinized rubber.

Through logic, the skilled artisan would reasonably conclude that there would be little to no difference in the efficiency of the grafting and epoxidation processes when using natural rubber versus deproteinized rubber, since the naturally occurring proteins are not extracted from the rubber, *per se*, and are simply broken down to smaller units called polypeptides.

Yasuyuki et al teaches that the deproteinized rubber still contains the polypeptides formed during the deproteinization step (see line 34 of

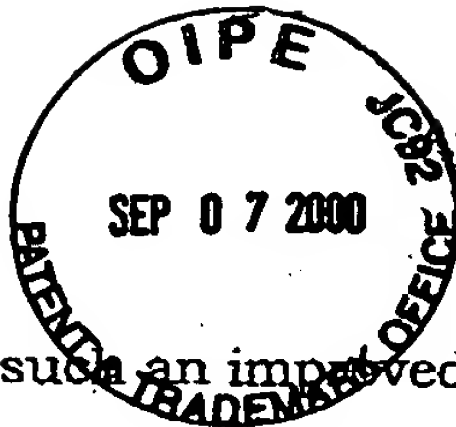


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page 4 to line 9 of page 5). Therefore, the skilled artisan would reasonably conclude that there would be little or no improvement in the efficiency of the graft-copolymerization and/or epoxidation reactions using the deproteinized rubbers, since the polypeptides from the naturally occurring proteins are still present and would impede the graft-copolymerization and/or epoxidation reactions in the same manner as would the naturally occurring proteins.

The present invention, in part, relates to the improved efficiency of the graft-copolymerization and/or epoxidation reactions using the deproteinized rubbers versus natural rubber. Upon review of Tables 1-3 on pages 20, 22 and 25 of the specification, it is clear that as the protein content decreases, the graft ratio increases, i.e., the percents of the monomers which are grafted to the main chain backbone of the rubber polymer increases. Likewise, the epoxidation ratio increases as the protein content decreases, as shown in Table 2.

In my opinion, this improved efficiency of the graft-copolymerization and/or epoxidation reactions using the deproteinized rubbers is unexpectedly superior to the graft-copolymerization and/or epoxidation reactions using natural rubber, since: 1) the polypeptides of the naturally occurring proteins are still present in the deproteinized rubber of Yasuyuki et al; and 2) the combination of Yasuyuki et al., Kondo et al., and either Burlett et al. or Hayashi et al, fail to teach or



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suggest that there would be such an improved efficiency. Thus, the presently claimed epoxidized or graft copolymerized rubber is not made obvious by the combination of Yasuyuki et al., Kondo et al., and either Burlett et al. or Hayashi et al.

All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true. Further, these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Yoshiaki Miyamoto
Yoshiaki MIYAMOTO

Y. M. 04/24/00
Date